

REMARKS

The U.S. Patent and Trademark issued an office action dated May 14, 2003. In response to this office action, applicant responds as follows:

In respect to the examiner's objection to claims 54 and 55 for reciting a dependent "method" instead of a dependent "apparatus", applicant has amended the claims to be consistent with the examiner's suggestion.

In respect to the examiner's rejection to claims 24-55, 59, and 65 under 35 USC 112, applicant has modified the pertinent independent claims in an attempt to clarify the claims in the areas suggested by the examiner.

In respect to the rejection to claims 56-58, 60-64, and 66 under 35 USC 102(b) be as being anticipated by Wirz, applicant has modified independent claim 56 to recite that the fixture is moved substantially perpendicular to a line through two points of a segment. This is different than the cited Wirz reference which utilizes an acute angle of contact.

In respect to claim 60, applicant has modified this claim to recite that the positioning fixture contacts the segment at only two points. Again, this differentiates over the examiner's Wirz reference which has an acute angle.

In respect to claim 61, applicant has modified this claim to recite that the roll is in contact with the segment. Wirz does not have a roll.

In respect to claims 62 and 63, these claims further distinguish over the Wirz reference by citing a roll with the size greater than the size of a segment. Wirz does not have a roll with this size.

In respect to claim 64, this claim recites that the rotor has main lines of action and characterized in that the two points of contact are located within the main lines of action. This is not true of the Wirz reference.

In respect to claim 66, this claim recites there is a ring in contact with the end surface of the rotor to retain the rotor in respect to the arbor. Wirz does not disclose some sort of connection between the end and tail stock (see fig 1). However, one has to speculate as to how the tooth work piece is connected to these members. It is not believed speculation is a proper basis for a rejection based on prior art.

In view of the above, applicant respectfully requests the examiner's reconsideration of the rejections.

Favorable action is solicited.

Respectfully submitted,

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Claims 1-23 cancelled on 12/18/01.

Claim 24. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least two segments,

the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate one segment of the developed surface with a positioning roll connected to a moveable clamp,

and means to operate the formed grinding wheel to grind a different segment of the developed surface.

Claim 25. The apparatus of claim 24 wherein the one segment of the developed surface has a valley having a size and characterized in that said location means utilizes a positioning roll a size greater than the size of the valley with the positioning roll having a two point contact with such valley.

Claim 26. The apparatus of claim 24 characterized in that a line from the center of the positioning roll to the different segment through the bottom of the developed valley being ground forms an angle less than 60° .

Claim 27. The apparatus of claim 25 characterized in that a line between said two points of contact with the valley is between 0° and 60° in respect to a segment perpendicular through the center of said positioning roll and the center of said line.

Claim 28. The apparatus of claim 25 wherein the formed grinding wheel has an axis of rotation and characterized in a line extending through said two points of contact of the positioning roll with the valley intersects the axis of rotation of the formed grinding wheel at an angle of between 30° and 60° .

Claim 29. The apparatus of claim 24 characterized in that said locating means utilizes two or more positioning rolls.

Claim 30. The apparatus of claim 24 characterized in that said locating means utilizes three or more positioning rolls.

Claim 31. The apparatus of claim 25 characterized in that said locating means utilizes two points of contact established by two different positioning rolls.

Claim 32. The apparatus of claim 25 wherein the member is a rotor and characterized in that said locating means utilizes a segment line running through the two points of contact substantially perpendicular to a line running from the center of the rotor through said segment line.

Claim 33. The apparatus of claim 32 characterized in that said locating means utilizes multiple positioning rolls, multiple segments, and multiple perpendiculars.

Claim 34. The apparatus of claim 25 wherein the member is a rotor with main lines of action in respect to a certain valley and characterized in that said locating means utilizes points of contact within said main lines of action.

Claim 35. The apparatus of claim 25 wherein the member is a rotor with main lines of action in respect to a certain valley and characterized in that said locating means utilizes points of contact at said main lines of action.

Claim 36. The apparatus of claim 25 wherein the member is a rotor with main lines of action in respect to a certain valley and characterized in that said locating means

utilizes points of contact are outside of said main lines of action.

Claim 37. The apparatus of claim 25 characterized by an additional developed surface and an additional positioning roll and said locating means utilizes said additional positioning roll having a one point contact with said additional developed surface.

Claim 38. The apparatus of claim 24 characterized by grinding means to rough ground one segment of said developed surface as a reference surface prior to production grinding the different segment of the developed surface.

Claim 39. The apparatus of claim 24 wherein there are two positioning rolls and the member has first and second segments of the developed surface and at least a third segment of the developed surface,

characterized by means for locating the first and second segments in succession for grinding, and means for engaging the first and second segments with the positioning rolls respectively before grinding the third segment.

Claim 40. The apparatus of claim 39 wherein a finished segment has a certain size and characterized in that the first and second segments are ground oversized as reference grinds while the third segment is ground as a finished segment of its certain size.

Claim 41. The apparatus of claim 39 characterized in that the two positioning rolls are angularly spaced by a certain number of degrees and the first and second segments are angularly spaced by the same number of degrees for engagement therewith prior to grinding the third segment.

Claim 42. The apparatus of claim 41 characterized in that the third segment is adjacent to one of the first or second segment.

Claim 43. The apparatus of claim 39 characterized means to angularly space the first and second segments by substantially 180° .

Claim 44. The apparatus of claim 40 wherein the member has a fourth segment and after the third segment is ground the index means are utilized such that the two positioning rolls are engaged with differing surfaces of the

first and second segments respectively prior to grinding the fourth segment.

Claim 45. The apparatus of claim 44 wherein the member has a fifth segment and after the fourth segment is ground,

the index means indexes the member such that the two positioning rolls are engaged with the third and fourth segments prior to grinding the fifth segment.

Claim 46. The apparatus of claim 45 wherein the member has a sixth segment and after the fifth segment is ground,

the indexer means indexes the member such that the two positioning pieces are engaged with differing surfaces of the fourth and fifth segments respectively prior to grinding the sixth segment.

Claim 47. The apparatus of claim 45 characterized in that the first and second segments are coextensive with the fifth and sixth segments.

Claim 48. The apparatus of claim 45 characterized by engagement means for engaging the fifth and sixth segments with

the two positioning pieces prior to regrinding one of the first or second segments.

Claim 49. The apparatus of claim 24 using a formed grinding wheel to grind a member having an external developed surface with at least three segments,

the improvement of locating means for locating two segments of the developed surface with positioning rolls connected to a moveable clamp and then using a grinding means to grind a different segment of the developed surface.

Claim 50. The apparatus of claim 49 wherein there are two segments of the developed surface having a valley having a size and characterized in that the positioning rolls engaging same respectively have a size greater than the size of the valley with such positioning rolls having a two point contact with such valley.

Claim 51. In the apparatus of claim 24 using a formed grinding wheel to grind a member having an external developed surface with at least four segments,

the improvement of means for locating three segments of the developed surface with positioning rolls connected to a

moveable clamp prior and using a grinding means to grind a different segment of the developed surface.

Claim 52. The apparatus of claim 51 wherein there are three segments of the developed surface having a valley having a size and characterized in that the positioning rolls engaging same respectively have a size greater than the size of the valley with such positioning rolls having a two point contact with such valley.

Claim 53. The apparatus of claim 52 wherein the member has a seventh segment and indexing means to index the member after the sixth segment is ground,

such that the two positioning rolls are engaged with the fifth and sixth segments prior to grinding the seventh segment.

Claim 54. The apparatus of claim 53 wherein the member has a eighth segment and indexing means to index the member after the seventh segment is ground,

to index the member such that the two positioning pieces are engaged with differing surfaces of the fifth and sixth segments respectively prior to grinding the eighth segment.

Claim 55. The apparatus of claim 54 characterized in that the first and second segments are coextensive with the seventh and eighth segments.

Claim 56. An apparatus for positioning a member having a developed surface in respect to a grinding wheel, the developed surface including a segment,

the apparatus including a fixture, said fixture being larger than the segment, and engagement means to engage said fixture with the segment at only two points in a direction substantially perpendicular to a line through said two points.

Claim 57. The apparatus of claim 56 characterized in that said engagement means includes movement of said fixture.

Cancel Claim 58 herein.

Claim 59. An apparatus for positioning a member having a developed surface in respect to a grinding wheel having an engagement angle, the developed surface including a segment,

the apparatus including a fixture and engagement means to engage said fixture with the segment in a direction

substantially perpendicular to the engagement angle of the grinding wheel,

the addition of means to move the grinding wheel to grind oversized reference grinds until one such reference grind is in engagement with said fixture.

Claim 60. An apparatus for positioning a member having a segment of a developed surface,

the apparatus including a positioning fixture and said positioning fixture contacting the segment at only two points.

Claim 61. The apparatus of claim 60 characterized in that said positioning fixture includes a roll in contact with the segment at said only two points.

Claim 62. The apparatus of claim 61 wherein the segment has a size and said roll having a size greater than the size of the segment.

Claim 63. The apparatus of claim 62 characterized in that said positioning fixture is external to the segment.

Claim 64. An apparatus of claim 62 wherein the member is a rotor having main lines of action and characterized in that said two points of contact are located within said main lines of action.

Claim 65. An improvement for an apparatus for positioning a rotor having a valley inclusive segment, the valley having a size,

the improvement of a positioning roll, said positioning roll having a size, said size of said positioning roll being greater than the size of the valley and said positioning roll being in contact with the valley to position the rotor.

Claim 66. A contact surface for retaining a rotor in respect to an arbor, the rotor having a valley radius and an end surface,

the contact surface comprising a ring, said ring being smaller than the valley radius of the rotor, and said ring being in contact with the end surface of the rotor to retain it in respect to the arbor.